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QUERY BY PROF. A. HALL.—(1). If v be the potential function we have the equation given by Laplace

$$\frac{d^2 v}{dx^2} + \frac{d^2 v}{dy^2} + \frac{d^2 v}{dz^2} = 0,$$

which holds for a point outside the attracting body. For a point inside this body we have the equation given by Poisson,

$$\frac{d^2 v}{dx^2} + \frac{d^2 v}{dy^2} + \frac{d^2 v}{dz^2} = -4\pi\rho.$$

What is the value of the right hand side of this equation for a point on the surface of the attracting body? Moigno says, "in this case the expression will have in reality eight distinct values." Statics, p. 460.

(2) Given a hemispherical dome turning about a pin at the top, and having a slit extending from the horizon to the zenith. Can a telescope be placed inside this dome in such a position that every point of the heavens can be seen through the telescope?

QUERY BY T. W. WRIGHT, U. S. LAKE SURV. DETROIT, MICH.—Can a satisfactory proof be given of the statement that "the weight of an observation varies as the square of the probability of its accuracy"? (Monthly Notices R. A. S., Vol. XIII.)

QUERY BY PROF. WM. WOOLSEY JOHNSON, ANNAPOLIS, MD.—"It is stated in Brande and Cox' Dictionary of Sc. and Lit., with respect to Fermat's 'lost theorem', viz.: that $x^n + y^n = z^n$ is insoluble in integers except when $n=2$, that no complete demonstration has yet been given. Yet Barlow in his Theory of Numbers gives what professes to be a demonstration of the impossibility of the equivalent equation $x^n - y^n = z^n$, p. 164.

What is the fallacy in Barlow's demonstration and by whom was it first exposed?"

PROBLEMS.

313. *By Prof. De Volson Wood.*—A piston, weight w , is dropped into the end of a vertical cylinder filled with air, length l ; how far will the piston descend, assuming no friction nor escape of air, nor heat from the compressed air?

314. *By Prof. L. G. Barbour, Richmond, Ky.*—A helix is coiled about a right cylinder the radius of whose base is 1. The projection of the evolute of the helix on the plane of the base of the cylinder encloses double the area of that base. Required the angle made with the plane of the base by the tangent to the helix.

315. *By T. W. Wright, U. S. Lake Survey, Detroit, Mich.*—Two marksmen compete for a prize. Three shots are to be fired by each. The distance of each shot hole from the bull's eye is measured and he is the winner whose total distance is least. *A*'s three shots measured respectively 1, 2, 3 in. from the bull's eye. *B* then made three shots and the bull's eye fell off leaving no mark by which it could be replaced.

An examination showed that the coordinates of *B*'s shot holes, referred to an origin arbitrarily taken, were

(0, 0) inches, (1, 1) in. and (2, 3) inches.

Which of the marksmen was the probable winner?

316. *By W. E. Heal, Wheeling, Ind.*—Required the value of

$$\frac{\log x \sqrt{1 - a^2 x^2}}{\sqrt{1 - x^2}}$$

where $x = 1$, and $a = \log(1 - x)$.

317. *By William Hoover, Wapakoneta, Ohio.*—If the scale of relation of a recurring series be $a_n - 7a_{n-1} + 12a_{n-2} = 0$, and if $u_0 = 2$, $u_1 = 7$, find u_n , and the sum of $u_0 + u_1 + \dots + u_{n-1}$.

318. *By G. H. Harvill, Colfax, La.*—A man takes hold of the end of a cart tongue and travels off at right angles to the direction in which the tongue originally lay. Required the equation of the curve made by the middle of the axle.

319. *By Prof. Scheffer.*—Within a triangle to determine a point so that if the three perpendiculars are let fall from it upon the sides of the triangle, the latter will be divided into three equal parts.

PUBLICATIONS RECEIVED.

On the Ghosts in Rutherford's Diffraction Spectra: A Quincuncial Projection of the Sphere: Note on the Theory of the Economy of Research: By C. S. PEIRCE. 4to. [Published by the authority of the Superintendent of the U. S. Coast and Geodetic Survey.]

Observations of the Satellites of Mars. [March, 1880.] By PROFESSOR A. HALL. [Reprinted from the Monthly Notices, R. A. S., Vol. XL, No. 5.]

On the Observations of Double Stars. By ASAPH HALL, of Washington, D. C. [From the Proceedings of the A. A. A. S., Vol. XXVIII, August, 1879.]

ERRATA.

On page 38, line 6 from bottom, for "*ABEF*" read, *ABED*.

" " 111, line 2 from bottom, for $(\triangle z)_0$ read, $(\triangle z)^0$.

In the diag. "(83)" p. 115, the figure 9 in the right hand section and lower row is reversed.